

Having thus described the invention, it is now claimed:

1. A light producing and monitoring system comprising:
  - a light producing device from which light is emitted with wavelengths
  - 5 that can range from approximately 700nm to approximately 3 microns ; and
  - a semi-transparent sensor located in front of the light producing device, at least a portion of the emitted light passes through the semi-transparent sensor and at least a portion of light is absorbed by the semi-transparent sensor, wherein the semi-transparent sensor is configured to be semi-transparent at the wavelength of the emitted
  - 10 light.
2. The system according to claim 1 wherein the sensor is configured on a semi-transparent substrate.
3. The system according to claim 2, further including a micro-lens integrated on a surface of the substrate opposite the side on which the sensor is configured, to refocus the light after passing through the sensor, wherein the light emitting device, the sensor and the micro-lens are aligned to permit the emitted light to pass there through.
- 20 4. The system according to claim 2, further including a lens, configured separate from the sensor and light emitting device, the lens used to refocus the emitted light after passing through the sensor.
- 25 5. The system according to claim 12 wherein the light emitting device and the substrate connected together by a flip-chip process.
6. The system according to claim 2 wherein the sensor configured on the substrate includes,
  - a first transparent/conductive electrode layer ;
  - 30 an active sensor element configured on top of the first transparent/conductive electrode; and

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a second transparent/conductive electrode layer.

7. The system according to claim 6 wherein,

the active sensor element is configured of sub-layers including,

5 a first sub-layer consisting of at least one of a n+ doped amorphous silicon or an amorphous silicon-germanium compound,

a second sub-layer consisting of at least one of intrinsic amorphous silicon or an amorphous silicon-germanium compound, and

10 a third sub-layer consisting of at least one of a p+ doped

amorphous silicon or an amorphous silicon-germanium compound.

8. The system according to claim 7 wherein the semi-transparent sensor further includes,

an anti-reflection coating located on an upper surface of the second transparent/conductive electrode layer.

9. The system according to claim 7 wherein the semi-transparent sensor further includes,

20 an anti-reflection coating located on a lower surface of the first transparent/conductive electrode layer.

10. The system according to claim 7 wherein the semi-transparent sensor further includes,

25 a first multi-layer coating located on an upper surface of the second transparent/conductive electrode layer; and

a second multi-layer coating located on a lower surface of the first transparent/conductive electrode layer,

wherein the first and second multi-layer coatings on the surfaces of the second transparent/conductive electrode layer create a cavity for which an electric field 30 standing wave profile is formed.

11. The system according to claim 8 wherein the sensor has a reflectance of light of not more than 0.4% at 850nm.

12. The system according to claim 9 wherein the sensor has a reflectance of  
5 light of not more than 0.4% at 850nm.

13. The system according to claim 10 wherein the sensor has a reflectance of light of not more than 0.4% at 850nm.

10 14. The system according to claim 6 wherein the semi-transparent sensor further includes,

an anti-reflection coating located on an upper surface of the second transparent/conductive electrode layer .

15. The system according to claim 6 wherein the semi-transparent sensor further includes,

a first multi-layer coating located on an upper surface of the second transparent/conductive electrode layer;

20 a second multi-layer coating located on a lower surface of the first transparent/conductive electrode layer,

wherein the first and second multi-layer coatings on the surfaces of the second transparent/conductive electrode layer create a cavity for which an electric field standing wave profile is formed.

25 16. A light producing and monitoring system comprising:

a light producing device from which light is emitted with wavelengths that can range from approximately 1.1 microns to approximately 1.7 microns ;

a semi-transparent substrate;

30 a semi-transparent sensor configured on a first surface of the semi-transparent substrate including,

a first transparent/conductive electrode layer (such as Indium Tin Oxide, Tin Oxide, Zinc Oxide, or polycrystalline silicon);

an active sensor element is configured of sub-layers including,

a first sub-layer consisting of at least one of a n<sup>+</sup> doped

5 amorphous silicon or an amorphous silicon-germanium compound;

a second sub-layer consisting of at least one of intrinsic  
amorphous silicon or an amorphous silicon-germanium compound; and

a third sub-layer consisting of at least one of a p<sup>+</sup> doped  
amorphous silicon or an amorphous silicon-germanium compound,

10 a second transparent/conductive electrode layer (such as Indium  
Tin Oxide, Zinc Oxide, and polycrystalline silicon);

the semi-transparent sensor located in front of the light producing  
device, such that at least a portion of the emitted light passes through the semi-  
transparent sensor and at least a portion of light is absorbed by the semi-transparent  
sensor, and wherein the semi-transparent sensor is configured to be semi-transparent at  
the wavelength of the emitted light.

17. A fiber optic component comprising:

20 a first fiber optical cable;

a second fiber optical cable configured to send light to or receive light  
from the first fiber optical cable; and

a light sensor configuration located between the first and second fiber  
optical cables, including a semi-transparent sensor which senses a portion of the light  
25 signal being passed from the first fiber optical cable to the second fiber optical cable.

18. The system according to claim 17 wherein the light sensor configuration  
includes at least one of a focussing lens or a collimator to cause the light signal from the  
first fiber optical cable to be refocused or collimated into the second fiber optical cable.